CATHERINE CASEWELL
Specialist Paediatric/Neonatal Dietitian/Lead Neonatal Dietitian

A summary of key 2025-2026 trends in breast milk fortification

Introduction

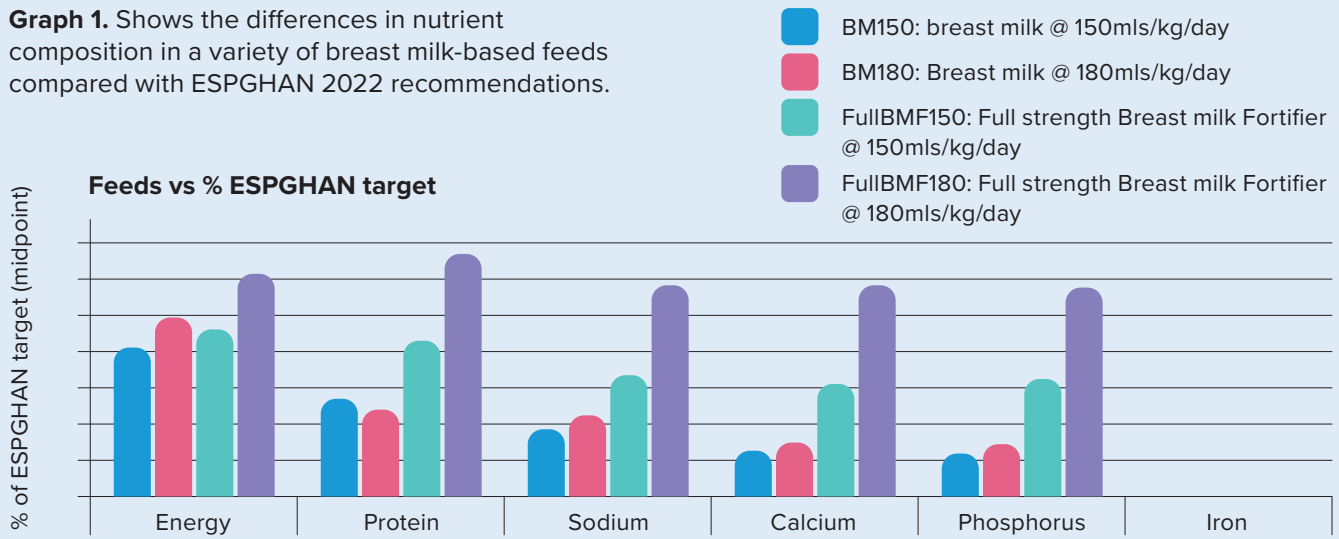
Breast milk is the best choice for feeding premature infants; however, it is well documented that it does not meet the higher nutritional requirements of the preterm infant unless fully fortified (Graph 1). Many studies are currently examining the composition of Breast Milk Fortifier (BMF) and feeding strategies to optimise both long- and short-term outcomes for preterm infants.[1-3]

Fortification matters!

Fortification with BMF is recommended for all infants born <32 weeks. Its benefits have been demonstrated in supporting with:[4,5]

- Optimal growth velocity
- Bone mineralisation
- Neurodevelopment
- Reduced complications (e.g. necrotising enterocolitis (NEC), sepsis, feeding intolerance).

Graph 1. Shows the differences in nutrient composition in a variety of breast milk-based feeds compared with ESPGHAN 2022 recommendations.



ESPGHAN: European Society for Paediatric Gastroenterology, Hepatology & Nutrition

How is BMF used?

- Expressed breast milk is usually fortified using pre-measured sachets (e.g., one sachet per 25-50ml), though some units follow their own protocols.
- Neonatal staff or parents mix the BMF in line with Family Integrated Care (FiCare) principles and local guidelines.
- Babies generally receive it until they maintain adequate growth, or as directed by hospital policy.

Recent UK research has focused on three areas of fortification:

1.

Nutrient source: Human milk-derived fortifiers (HMDF) vs standard cow's milk-based products.

Evidence shows lower NEC risk with higher maternal breast milk intake and with donor milk instead of formula, prompting interest in whether an exclusive human milk diet (EHMD) might offer added protection.[1-3] In the UK, BMF (or human milk fortifier, HMF) is currently made from hydrolysed cow's milk protein, meaning infants remain exposed to cow's milk proteins even without formula. Concerns about NEC risk have encouraged further research into EHMDs.[6] Several UK clinical trials have now examined nutrient source in BMF, which are summarised in Table 1.

Practical considerations:

- Bovine fortifiers can support adequate growth in infants < 32 weeks[11,12]
- Liquid fortifiers dilute the quantity of breast milk received[13]
- Liquid fortifiers may further reduce maternal milk intake
- Human-derived fortifiers are significantly more expensive and not widely available in the UK[14]
- More UK specific evidence is needed on short and long term outcomes of human milk-based fortifier.

Table 1: A summary of the findings for recent UK studies on BMF

Study	Year	Authors	Summary of Findings
Human vs bovine fortifier body composition randomised controlled trial (RCT)[7]	2022	Uthaya et al	Body composition & growth: A direct comparison of human-derived vs bovine fortifier showed no meaningful differences in MRI measured Fat Free Mass (FFM) or Fat Mass at term. Anthropometrics were not different between the groups. Nutrient intakes were matched for the study.
Early human milk fortification RCT[8]	2023	Salas et al	Human milk diets fortified soon after birth in infants born extremely preterm do not increase FFM accretion at term-equivalent age. Early provision of fortified human milk within the first 96 hours after birth may increase length gain velocity and reduce declines in head circumference-for-age z scores from birth to 36 weeks' Post Menstrual Age (PMA).
PUFFIN: Human-based fortifier vs standard cow's milk-based fortifier[9]	2023	Berrington et al	No detection of reduced gut inflammation as measured by faecal calprotectin in HMF compared to cow's milk-based fortifier but weight gain was slower. Of potential clinical importance.
PREMFOOD body composition analysis[4]	2025	Mills et al	Early human-based fortification (from day 2) did not increase FFM at 36 weeks PMA, but improved length velocity and reduced head circumference z-score decline. NEC and Spontaneous Intestinal Perfusion rates were low and similar between fortified and unfortified groups, with no significant differences in adverse events observed.
Protein enriched fortifier RCT[10]	*2021*	Salas et al	Infants receiving higher-protein fortifier showed significantly greater FFM and weight gain at term-equivalent age reflecting enhanced lean-tissue deposition. Length and head-circumference z-scores were also improved

2.

Feeding strategies:

- **Increasing use of individualised (targeted) fortification**
  UK neonatal units are gradually moving away from standard 'one size fits all' fortification toward individualised or targeted approaches. Growth parameters are increasingly used to adjust BMF dosing to better match infant requirements. Breast milk analysers are widely used in the USA, but UK uptake is unknown, and evidence is still emerging. Targeted fortification may improve growth velocity, optimise nutrient intake, and reduce risks of under- or over- feeding.[15-17]
- **Fortification of donor milk**
  Many UK Neonatal units are following the 2025 British Association of Perinatal Medicine (BAPM) *Donor Human Milk Framework* which recommends using pasteurised donor milk when maternal milk is unavailable.[18] Internationally, some centres use higher fortifier concentrations for donor milk (e.g., 6 sachets/100ml vs 4 sachets/100ml for maternal milk), producing "donor milk at 26kcal" and "maternal milk at 24kcal".[14]

Practical considerations:

- Establish unit- or network-based guidelines which include a more individualised fortification
- Optimise fortification of Donor Human Milk (DHM) as well as Mum's Own Milk (MOM)
- Consider adoption of milk analysis tools and targeted fortification but consider:
  - Breast milk composition varies within and between mothers
  - Individualised fortification is labour intensive.

3.

Clinical outcomes beyond growth

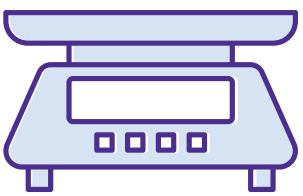
- Research is exploring effects on neurodevelopment, feeding tolerance, NEC risk, inflammation, and long-term outcomes to improve digestive tolerance and target nutrient profiles.[19]
- Innovations are emerging in neonatal BMF studies, including adding probiotics, prebiotics, and synthetic human milk oligosaccharides (HMOs). These may enhance gut health, immunity and reduce risk of infection.[20,21]

Practical considerations:

- These developments signal a move toward increasingly personalised, microbiome-aware fortification approaches designed to optimise growth and support healthier long-term outcomes.

Summary

This article has outlined key 2025-2026 developments in breast milk fortification for preterm infants. While breast milk remains the optimal feeding choice, it requires fortification to meet the nutritional needs of very preterm babies. It highlights recent UK research comparing human-derived and cow's milk-based fortifiers, early versus delayed fortification, and impacts on growth, body composition and NEC risk. Emerging trends include increasing use of individualised or targeted fortification, optimising donor milk fortification and exploring additives such as probiotics and HMOs.



> While breast milk is the foundation of preterm nutrition, fortification strategies are key to optimising growth and long-term outcomes.

References

1. *Quigley, et al. Cochrane Database Syst Rev. 2019;7(7):CD002971.*

2. *Miller, et al. Nutrients. 2018;10(6):707.*

3. *Sullivan, et al. J Pediatr. 2010;156(4):562-7.*

4. *Mills, et al. Nutrients. 2025;17(8):1366.*

5. *NHS Kent, Surrey & Suffolk Operational Delivery Networks [Online]. 2024. https://neonatalnetworkssoutheast.nhs.uk/wp-content/uploads/2024/02/KSS-BMF-Principles-of-Practice-FINAL.pdf [Accessed March 2026].*

6. *Agostoni, et al. J Pediatr Gastroenterol Nutr. 2010;50(1):85-91.*

7. *Uthaya, et al. Early Hum Dev. 2022;171:105619.*

8. *Salas, et al. Pediatrics. 2023;152(3):e2023061603.*

9. *Berrington, et al. J Pediatr Gastroenterol Nutr. 2025;80(2):336-44.*

10. *Salas, et al. Pediatr Res. 2022;91(5):1231-7.*

11. *Picaud,et al. Arch Dis Child Fetal Neonatal Ed. 2025;110(5):512-9.*

12. *Embleton, et al. Pediatrics. 2001;107(2):270-3.*

13. *Kim, et al. J Pediatr Gastroenterol Nutr. 2015;61(6):665-71.*

14. *Hair, et al. Breastfeed Med. 2016;11(2):70-4.*

15. *Arslanoglu, et al. J Perinatol. 2006;26(10):614-21.*

16. *Choi, et al. PLoS One. 2016;;11(2):e0148941.*

17. *Fusch, et al. Clin Nutr. 2015;34(3):465-76.*

18. *British Association of Perinatal Medicine (BAPM) [Online]. 2023. www.bapm.org/resources/the-use-of-donor-human-milk-in-neonates [Accessed March 2026].*

19. *Belfort, et al. Semin Fetal Neonatal Med. 2017;22(1):42-8.*

20. *Underwood. J Pediatr Surg. 2019;54(3):405-12.*

21. *Puccio, et al. J Pediatr Gastroenterol Nutr. 2017;64(4):624-31.*

NUTRICIA ACADEMY
Feed your mind